56K Internal Modem

User's Manual
Manuel de l'utilisateur
Benutzerhandbuch
Manual dell'utente

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FCC Notice

This equipment complies with Part 68 of the FCC rules. Located on the bottom side of the modem is a label that contains, among other information, the FCC Registration Number and Ringer Equivalence Number (REN) for this equipment. Upon request, you must provide this information to your telephone company.

If your telephone equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But, if advance notice is not practical, you will be notified as soon as possible. You will also be informed of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

If this equipment should fail to operate properly, disconnect the equipment from the phone line to determine if it is causing the problem. If the problem is with the equipment, discontinue use and contact your dealer or vendor.

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English

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Introduction

This 56K Internal modem provides the highest speed access to the Internet and online services, and especially accelerates downloading graphics, telegaming, and collaborative computing. It's the highest speed international FAX/ modem PC Card available. This modem operates over standard telephone lines, so you don't have to pay additional, up-front, monthly costs for special lines.

Features

- Highest Internet connection rates, downstream speeds to 56K, backward compatible with V.34 modems
- Data mode capabilities:
  - ITU-T V.34 extended rates: 33600bps ~ 2400bps
  - V.32terbo, V.32bis
  - TIA/ EIA 602 standard for AT command set
  - V.42 error correction (LAPM and MNP)
  - V.42bis and MNP Class 5 data compression
- Fax mode capabilities:
  - ITU-T V.17, V.29, V.27ter, and V.21 Ch 2
  - TIA/ EIA 578 Class 1
- Auto-dial, call progress monitor
- Ring, line break detection
- Low power consumption
- ISA Plug & Play
- Software upgradeable to ITU standard V.90

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Introduction

- Software support
  - Drivers provided for Microsoft Windows 95 and Windows NT.
  - Supports telephony software, including Procomm, WinFAX, BitWare, and SuperVoice

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Setting Up the Modem in Windows 95/98

Your modem uses the Plug and Play (PnP) capabilities of you computer. PnP is a set of specifications that define the ability for the computer hardware and operating system to automatically configure all compliant devices that are installed, relieving the user of the need to determine which addresses and interrupts to user for each device.

Installing the Driver

The version of Windows 95 you have will determine which set of dialog boxes is presented to you when installing the modem in Windows 95. In general, follow these steps:

1. Select **My Computer**, then **Control Panel**.
2. Double-click on **System**.
3. Click on **Device Manager**.
4. Double-click on **Other devices**.
5. Click on **LT Win Modem**.
6. Click on **Driver**.
7. Click on **Update Driver**.
8. Select **Yes** and click on **Next**.
9. Click on **Other Locations...**.
10. Type **<CD-ROM>:\ DRIVERS\ WIN95\ MODEM** and click on **OK**. (where <CD-ROM> is the drive letter of your CD-ROM drive, e.g., D).
11. Follow the installation instructions on the screen.
12. Click on **Finish**.

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Installation

Installing and Configuring the Software

Install the communication software according to the software user's modem of the same COM port and IRQ line used by the modem.

You may be prompted by the software to configure certain communication parameters. We suggest the following settings:

Item	Suggested Setting
Baud rate	38400 bps
Data bits	8
Parity	none
Stop bit	1
Flow control	RTS/CTS
Initialization string	AT&F

Testing Your Modem

In order to check if the modem is functioning properly, make sure that the COM Port and IRQ settings of the modem match the software. Type AT on your terminal screen and press **ENTER**. The modem should respond by displaying an OK (or 0). If it does not, either the modem may not have been installed properly or the software has not been properly configured.

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Setting Up the Modem in Windows NT

Prepare the following to install the modem driver for Windows NT:

- ❑ Windows NT 4.0 CD-ROM (includes the PNPISA.SYS file)
- ❑ Modem driver diskette

Installing the PNPISA.SYS File

Your modem is a Plug-and-Play modem and requires the PNPISA.SYS file to work in Windows NT. To install the PNPISA.SYS file, do the following:

1. Insert the Windows NT 4.0 CD-ROM into the CD-ROM drive.
2. Locate the **PNPISA.INF** file. This file is generally found in the **\drvlib\i386** directory of your Windows NT 4.0 CD-ROM.
3. Right-click on the **PNPISA.INF** file and select Install to begin installing the **PNPISA.SYS** file to your system.

Installing the Driver

Follow these steps:

1. Click on **Start**, **Settings**, **Control Panel**.
2. Double-click on **Ports**.
3. Remove any redundant port entry by selecting it and clicking on **Delete**.
4. Shutdown from Windows NT.
5. Restart your computer.
6. Windows NT detects the modem and prompts you for the driver (**LTMODEM.INF**).

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7. Insert the modem driver diskette into the diskette drive and follow the instructions on the screen install the driver.

   Click on **Set Configuration Manually** to set the COM port resources. The following resource settings are suggested:

Item	Suggested Setting
Modem I/O Address	100-107
COM I/O Address	2F8-2FF
COM IRQ	3

   If these settings are in conflict with other devices, you can select other settings based on the following conditions:

COM Port	I/O Address
COM2	2F8-2FF
COM3	3E8-3EF
COM4	2E8-2EF

   You can change the the setting by clicking in the **Setting based on:** combo box to make it match a setting from the table above.

   Note: *Note down the resource settings for future reference.*

8. Click on **OK** to install the driver.

9. Follow the instructions on the screen

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Testing Your Modem

In order to check if the modem is functioning properly, do the following:

1. Click on **Start**, **Programs**, **Administrative Tools (Common)**, **Windows NT Diagnostics**.
2. Select the **Resource** tab, and verify that **ltmodem** is in the device list. This means that your modem has been activated and you have successfully installed the modem driver.

*Note: If there is no **ltmodem** in the list, you need to reinstall the driver. Before you reinstall the modem driver, delete **LT Win Modem** from the Modem item in the Control Panel.*

Using Your Modem

The communication software included with your modem provides a user friendly interface to access the data and fax. The modem may also perform basic communication functions (such as dialing) via the AT commands. Please refer to AT Commands for detailed description. Since the communication software is designed to shield the user from the difficult and cumbersome AT commands, we strongly suggest that all modem operations be performed via the software.

COM Port and Interrupt Settings

The bundled device driver (optional) can auto configure your internal modem to appropriate COM port to avoid conflicts with your computer's built-in COM ports.

If your modem has to be configured for COM ports 1 or 2, you must disable the appropriate COM port on your computer. Refer to your computer manual for specific instructions on how to disable the COM port.

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Common IRQ assignments for COM 1 to COM 4 ports are:

COM Port	IRQ
1	4
2	3
3	4
4	3

Your device driver can be configured to different IRQ: IRQ3, IRQ10, and IRQ11.

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Troubleshooting

If you encounter problems while using your modem, please read this chapter. If you can not resolve your difficulties after reading this chapter, contact your dealer or vendor for assistance.

Modem does not respond to commands.

1. Make sure the communication software is configured with the correct COM port and IRQ setting (same COM port and IRQ setting as the modem). Your communication software will not be able to send or receive any data if it is not configured to match the COM and IRQ settings for the modem.
2. Make sure that your modem is initialized correctly. Your modem may have been improperly initialized by the software because you have selected an incorrect modem type. You may also be prompted to enter an initialization string by the software. Use AT&F as your initialization string.

Modem does not dial.

1. Make sure the modem is connected to a working phone line. Replace the modem with a working phone to ensure that the phone line is working.

Modem dials but does not connect.

1. Make sure the IRQ setting is identical on both the modem and the software.
2. Make sure the phone line is working properly. A noisy line will prevent proper modem operation.

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Troubleshooting

Modem makes a connection but no data appears on your screen.

1. Make sure all communication parameters (baud rate, data, stop, and parity bits) are properly configured and are identical on both sides. Be certain hardware flow control (RTS/CTS - default) is enabled in both the modem and the communication software.
2. Press the **ENTER** key several times. The remote system may be waiting to receive your data before it begins.

Modem experiences errors while on-line with a remote modem.

1. Make sure Call Waiting is turned off.
2. Make sure RTS/CTS hardware flow control is enabled (do not use XON/XOFF software flow control when transferring binary files).

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Basic AT Commands

Command	Function
A	Answer incoming call
A/	Repeat last command
B0	CCITT mode @1200 bps
B1	Bell mode @ 300/1200 bps
B2	Unselects V23 reverse channel
B3	Unselects V23 reverse channel
B15	CCITT @300 bps
B16	Bell mode @300 bps
C0	Transmit carrier always off
C1	Normal transmit carrier switching
D	0-9, A-D, * and #
DL	Redials last number
DP	Pause dialing
DT	Touch-tone dialing (default)
D,	Pause during dialing
DW	Wait for dial tone
DV	Modem switches to speakerphone mode
D@	Wait for quiet answer
DI	Hook flash
D;	Return to command mode
D^	Disable data calling tone transmission
DS=n	Dial one of the four stored phone numbers (n=0-3) in the modem's non-volatile memory

Command	Function
D$	Bong tone detection
E0	Disables echo to the computer
E1	Enables echo to the computer (default)
H0	Modem goes on-hook (default)
H1	Modem goes off-hook
I0	Returns default speed and controller firmware version
I1	Calculates ROM checksum and displays it on the DTE
I2	Performs a ROM check and calculates and verifies the checksum diplaying OK or ERROR
I3	Returns the default speed and the controller firmware version
I4	Returns firmware version for data pump
I9	Returns country code
L0	Selects low volume
L1	Selects low volume
L2	Selects medium volume (default)
L3	Selects high volume
M0	The speaker is off
M1	The speaker is on until the modem detects the carrier signal (default)
M2	The speaker is always on when modem is off-hook

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AT Commands

Command	Function
M3	The speaker is on until the carrier is detected, except while dialing
N0	Connect only at DTE rate
N1	Automatic rate negotiation
O0	Return to data mode
O1	Retain before returning to online data mode
O3	Rate renegotiation before returning to online data mode
P	Selects pulse dialing
Q0	Enables modem to send result codes to the computer (default)
Q1	Disables modem from sending result to the computer
T	Selects tone dialing
V0	Displays result codes as digits
V1	Displays result codes as text (default)
W0	CONNECT result code reports DTE speed Disable protocol result codes
W1	CONNECT result code reports DTE speed Enable protocol result codes
W2	CONNECT result code reports DCE speed Enable protocol result codes
X0	Hayes Smartmodem 300 compatible responses/blind dialing
X1	Same as X0 plus all connect responses/blind dialing
X2	Same as X1 plus dial tone detection
X3	Same as X1 plus busy signal detection/blind dialing
X4	All responses and dial tone and busy signal detection (default)
X5	Same as X4
X6	Same as X4
X7	Same as X0 plus dial tone and busy signal detection
Y0	Disable long space disconnect (default)
Y1	Enable long space disconnect
Z0	Reset and recall user profile 0
Z1	Reset and recall user profile 1
&B0	Disable V 32 auto retrain (not supported)
&B1	Enable V.32 auto retrain (default)
&C0	DCD circuit is always on
&C1	Turn on CD when remote carrier is present
&D0	DTR signal ignored
&D1	Modem returns to command mode after DTR toggle
&D2	Modem hangs up and returns to the command mode after DTR toggle
&D3	Modem resets after DTR toggle
&F0	Load factory default configuration
&G0	Load factory default configuration
&G1	Sets guard tone to 550 Hz
&G2	Sets guard tone to 1800 Hz
&J0	The auxiliary relay is never closed

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AT Commands

Command	Function
&J1	Not supported, responds ERROR
&K0	Disable flow control
&K3	Enable RTS/CTS flow control
&K4	Enable XON/XOFF flow control
&M0	Asynchronous mode (default)
&P0	34/66 make/break ratio (default)
&P1	33/55 make/break ratio (20 pps)
&O0	Asynchronous mode, buffered
&O5	Error control mode, buffered
&O6	Asynchronous mode, buffered
&O8	MNP error control mode
&Q9	V.42 or MNP error control mode
&S0	DSR always ON (default)
&S1	DSR is off in command mode, on in online mode
&T0	Abort. Stops any test in progress.
&T1	Run local analog loop
&T3	Run local digital loopback
&T6	Run remote digital loopback test
&V0	View active file
&W0	Store current configuration
&Y0	Select stored profile 0 on power-up
&Y1	ERROR
&Zn=x	Store telephone number x into non-volatile RAM, n=0-3
\G0	Returns an "OK" for compatibility
\G1	Not supported, responds ERROR
\J0	Turn off adjust bits/rate feature (default)

Command	Function
\J1	Turn on feature
\K5	Modem sends the break to the remote modem in sequence with the transmitted data, non-destructive non-expedited
\N0	Buffer mode. No error control.
\N1	Direct mode
\N2	MNP or disconnect mode
\N3	V.42, MNP or buffer (default)
\N4	V.42 or disconnect
\N5	V.42 MNP or buffer
\N7	V.42 MNP or buffer
\Q0	Disable flow control
\Q1	XON/XOFF software flow control
\O2	CTS-only flow control
\Q3	RTS/CTS to DTE (default)
\V0	Disable protocol result code appended DCE speed
\V1	Enable protocol result code appended DCE speed
\Tn	Inactivity timer (in minutes)
-C0	Data calling tone disabled (default)
-C1	Data calling tone enabled
\X0	Modem processes XON/XOFF flow control characters locally (default)
\X1	Not supported, responds ERROR
%B	View numbers in blacklist
%C0	V.42bis/MNP 5 disabled. No data compression.

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Command	Function
%C1	V.42bis/MNP 5 enabled. Data compression enabled (default)

FAX Class 1 Command

Command	Function
+Fclass=1	Service class
+FAE=0	Disable data/fax auto answer
+FAE=1	Enable data/fax auto answer
+FRH=n	Receive data with HDLC framing
+FRM=n	Receive data
+FRS=n	Receive silence, nx10 ms
+FTH=n	Transmit data with HDLC framing
+FTM=n	Transmit data
+FTS=n	Stop transmission and wait, nx10 ms

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S-Registers

Register	Function	Range/units	Default
S0	Auto answer ring number	0-255/rings	0
S1	Ring counter	0-255/rings	0
S2	AT escape character	0-255/ASCII	43
S3	Command line termination character	0-127/ASCII	13
S4	Response formatting character	0-127/ASCII	10
S5	Command line editing character	0-32, 127/ASCII	8
S6	Wait before dialing	2-65/seconds	2
S7	Connection completion time-out	1-255/seconds	50
S8	Comma dial modifier time	0-65/seconds	2
S10	Automatic disconnect delay	1-254/.1 seconds	20
S11	DTMF dialing speed	50-150/.001 seconds	95
S12	Escape guard time	0-255/.02 seconds	50
S28	V.34 modulation enable/disable	0-255	1
S30	Inactivity timer	0-255/minutes	0
S35	Data calling tone	0-1	0
S36	Negotiation fallback		7
S37	Dial line rate		0
S38	56K dial line rate	0-16	0
S42	Auto rate	0-1	1
S43	Auto mode	0-1	1
S48	LAPM error control and feature negotiation		7
S89	Timer to control sleep mode	0,5-255	10
S90	Local phone status	0-1	
S91	Line transmit level	6-15/1dB	15

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Result Code Summary

Result	Code
OK	0
CONNECT	1
RING	2
NO CARRIER	3
ERROR	4
CONNECT 1200 EC*	5
NO DIAL TONE	6
BUSY	7
NO ANSWER	8
CONNECT 2400 EC*	10
CONNECT 4800 EC*	11
CONNECT 9600 EC*	12
CONNECT 14400 EC*	13
CONNECT 19200 EC*	14

Result	Code
CONNECT 7200 EC*	24
CONNECT 12000 EC*	25
CONNECT 300 EC*	40
CONNECT 21600 EC*	55
CONNECT 24000 EC*	56
CONNECT 26400 EC*	57
CONNECT 28800 EC*	58
CONNECT 31200 EC*	59
CONNECT 33600 EC*	60
CONNECT 16800 EC*	86
DELAYED	88
BLACKLISTED	89
BLACKLIST FULL	90

* EC only appears when the extended result codes configuration option is enabled. EC is replaced by one of the following symbols, depending upon the error control and V.42bis data compression.

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